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Contents:

(Illustrated articles are marked with an asterisk.)

PUBLICATION OF THE PATENTS.

Our readers will remember that the publication of the diagrams and abstracts of the patents, in the annual Patent Office reports, was discontinued by Congress some three years ago, much to the dissatisfaction and inconvenience of a large portion of the public. But there was good reason for the discontinuance. The printing entailed an immense cost upon the government, while large quantities of the books, given over as they were to members of Congress for free distribution, were thrown away and wasted, or gathered into the cellars of wrapping paper dealers.

After the discontinuance of the reports, the Commissioner of Patents began the weekly publication of the patent claims in a special pamphlet, which has proved of much value, and is in a measure a substitute for the annual reports. This weekly pamphlet has lately been styled the *Official Gazette*, and it is furnished to regular subscribers at $5 a year. To make the *Gazette* still more complete, the Commissioner of Patents now proposes to publish in it, weekly, the drawings, with abstracts, of all patents issued. For the information of members of Congress and to illustrate the proposed method of publication, the Commissioner has caused to be issued one number of the *Gazette* with abstracts of the specifications, claims, and drawings of the patents for one week, the drawings being photo-lithographed on a reduced scale. This number is now before us, and it is altogether the most concise, economical, practicable and valuable form of patent publication that has yet been produced at Washington. It reflects the highest credit upon the Commissioner of Patents, and we trust that Congress will promptly grant the necessary authority and means for its continued and regular issue.

The present number of the *Gazette* presents the abstracts, claims and drawings of 205 new patents, and they occupy 26 pages. All the drawings are perfectly clear, and yet so compact is the printing that a single volume of 1,600 pages would suffice to contain the drawings and abridgments of all the patents for an entire year, or about thirteen thousand in number. The last complete Patent Office report, that of 1868, consisted of four volumes, comprising over 3,500 pages, and in it were illustrated not quite thirteen thousand patents. To be sure, the pages were a little smaller than those of the *Gazette;* but the economy of space, of paper, and consequently of expense, is considerably in favor of Commissioner Leggett's present plan of printing.

We earnestly hope that Congress will authorize the proposed publication. Nothing contributes more directly to the growth and prosperity of our varied industries than the general circulation of intelligent descriptions and drawings of the latest improvements. All our artisans are interested in them; they stimulate thought, they encourage industrial progress.

Having thus signified our approval of the Commissioner's project, for we regard it as a step in the right direction, we will now suggest, to him and to Congress, some reasons for advancing a little further. Instead of giving only abstracts of the specifications, we ask the Government to *print the specifications in full.*

The Commissioner shows us, in his specimen, how readily the drawings may be reduced and printed, and how compactly the abstracts may be presented. We ask him now to compact the publication a little more, and print the specifications and drawings in full every week, thus placing them conveniently before the public.

The chief defect of our present patent system consists in its lack of provision for the full publication of existing patents *in a condensed, cheap and popular form, so that everybody may possess them.* This once accomplished, patents may be granted to every applicant, and the present cumbersome and defective system of Patent Office examinations, with all its delays, expenses, injustices, and unnecessary prosecutions, may be discarded. Instead of a small corps of official examiners, we should then have twenty thousand examiners, every applicant for a patent being his own examiner.

In no country in the world is there so much patent litigation, or so much time and money wasted in procuring, defending, and wrangling about patents as in the United States. The value and validity of a patent rests upon the clearness of its statements and its priority over other patents. But when these other patents are unknown or difficult of access by the people, as are our patents, quarrels and confusion are the natural result.

It may be laid down as an axiom in regard to patents that, where the full specifications and drawings are easily accessible to the public, there will be little or no patent litigation.

In England, the drawings and specifications of all patents are printed in full and are, to a considerable extent, accessible to the public. The practical result is that England is almost exempt from patent litigation, although patents are granted to almost every person who chooses to file an application.

The evidence recently presented to Parliament shows that in all England the average number of patent cases in which proceedings are commenced before the courts is *only eighteen cases per annum!*

To say nothing of our courts, there is more trouble and litigation over patent cases before our Patent Office in one month, than there is in all the courts of England in an entire year! It is true that five times as many patents are granted here; but the excess of American litigation is out of all proportion to the augmentation of patents. We apply the term litigation to all contested patent cases.

The remedy is simple. 1. *Print the patents in full, at the cheapest rates, so that everybody may possess them.* 2. Grant patents to every applicant who presents proper papers. 3. Dispense with models, official examinations, rejections, appeals to Boards of Examiners, appeals to the Commissioner, appeals to the District courts, and all the other cumbersome machinery of the Patent Office which now burdens the inventor with expense and annoyance.

CONGRESS AND PATENT EXTENSION CASES.

As will be gathered from the letter of our special correspondent at Washington, published in another column, there is at the present time an unusual number of applications before the Committees on Patents in Congress for extensions of patents. The success of a few of the applicants, and the apparent facility with which those presented are reported upon by the Committees and passed by Congress, is giving encouragement to those disappointed in their efforts to obtain extensions before the Patent Office, and so increases the demands upon Congress for special legislation as to threaten to become a serious evil.

It has always been our opinion that Congress ought not to meddle with these cases, an opinion to which we have given the most clear and emphatic expression in these columns. We have never seen cause to change our views upon this subject, and we now repeat that the only proper action on the part of the National Legislature in regard to such applications is to authorize the Commissioner to take cognizance of and act upon applications which for valid reasons have not been presented during the time fixed by our patent laws. An application that the Commissioner has refused should never receive the sanction of the Committee on Patents, nor the time of Congress be used in discussing such claims. In the first place, that body has not the requisite knowledge, or time to obtain knowledge, on which to act intelligently. Second, the presentation of such applications is like those of claims, a great opportunity to the lobby, who will either enforce inventors to entrust these camp vultures with the prosecution of applications, or strive to defeat any favorable action. It is well known that the merit of a claim is seldom what passes it. We were once, when pressing the merits of a claim upon the mind of a distinguished member of the third house, interrupted by the bluff assurance that "bless your innocence, the merits make no manner of difference. Claims don't go through on their merits; but they do go through, and if you can spend money enough yours will go through, and not without." We would not spend money enough in this way, so our claim still stands unsatisfied.

It will not be long, if this sort of patent extension legislation continues, before it will become a matter of lobbying altogether, and it is not much better than that now. Occasionally the maladroitness of some blunderer gives the public a peep into the mysteries of lobbying. Some of our readers—not the oldest by any means—will recollect how one of these "too smart" manipulators, who pressed an application for the third extension of one of the most valuable patents ever granted, invited the lawgivers with their wives to a feast, and how beside each gentleman's plate was placed a handsome revolver mounted in the richest style, enveloped in a handsome case, and how beside each lady's plate was a box of the finest kids, and how, the fact being published abroad by the watch dogs of the press, the storm of protest thus evoked, through the lobby man's overdoing, made that gentleman's anticipated cake turn out the most underdone kind of dough. This thing was not done in a corner; that is probably the reason why it failed so signally in its desired effect, but it indicates the existence of the probabilities referred to. Skillful lobbyists understand more thoroughly the value of corners, both literal and figurative, than did the bungler who afforded the public an insight into the way things may be accomplished by demonstrating how not to do them.

The kind of action which we consider legitimate, namely, the authorization of the Commissioner to act on applications after the legal time has expired, may be exercised with justice and equity, and it gives less rise to jobbery; but the reasons for such exceptions should be good, and if, as in some cases, the fault rests with the party, who has omitted, through simple carelessness, to apply, within the period limited by law, to the Patent Office tribunal for his extension then we contend the applicant has no right to the attention of Congress to remedy his own heedlessness. The passing of an act to extend a patent, after the application has been refused by the Commissioner on grounds deemed valid and derived from thorough investigation, seems an insult to the intelligence of that officer, and is a kind of special legislation which must inevitably lead to corruption and foster monopolies. We see no reason why Congress should not as soon give a patent to a man who has been refused a grant on an original application as to extend a patent to one who has not only enjoyed all the privileges pertaining to his original patent, but has in the opinion of the Commissioner, who has the opportunity to know, reaped an adequate, or more than an adequate, reward for his invention and the labor and expense of introducing it to the public. But this is not the worst of patent legislation; after an extension of seven years by the Patent Office, making the monopoly enjoyed by the patentee 21 years—the limit allowed under the patent law—the patentee, or more usually the manufacturer monopolist in the name of the patentee, goes to Congress and asks a further extension for the poor inventor! Not because he has not been amply rewarded, but because he has made so much out of the invention as to enable him to afford the large expense necessary to enforce his claim. Those persistent applicants are the ones most likely to succeed before Congress, and it is against legislation in such cases that we most specially protest. Instead of encouraging and fostering inventions and manufactures, such legislation discourages the poorer inventors and brings into disrepute our patent system.

DRYING SUBSTANCES BY STEAM.

There are three physical states in which water may exist above the temperature of 32° Fahr.: first, as liquid; second, as saturated steam; third, as superheated steam. When the word "steam" is used alone, saturated steam is what is meant. Saturated steam always contains, as we have shown in previous articles, a specific number of units of heat in each unit of weight, no matter of what temperature or pressure. Steam generated where heat is applied only to the water from which the steam is made is always saturated, because no heat can pass into the water without converting a portion into steam. When we speak, then, of saturated steam, or simply *steam*, it is to be understood that such steam as contains the normal amount of water specific to steam generated from water under ordinary atmospheric pressure is meant. The weight of saturated steam corresponding to a given number of heat units is always the same for any pressure or temperature at which steam can be generated. This, of course, follows from the law previously stated, and therefore requires further no remark.

Superheated steam, on the contrary, is produced by applying heat to the steam while it is isolated from water, either by a *septum* of saturated steam, or by walls of metal or other suitable material. Superheated steam may contain more or less heat in proportion to its weight. It differs, therefore, from saturated steam in that its quantity of heat is not specific to its weight. These distinctions are important to the clear understanding of what is to follow.

Substances may be dried either by saturated steam or by superheated steam, and either the one or the other may be employed in one of two different ways, the principles of which differ.

First, the steam or superheated steam may be used in a confined state, as in racks of pipe, steam cylinders, etc. In this way, the heat is transmitted by the steam through the material, that surrounds it to the substance to be dried, the moisture in which, being thus transformed into vapor, passes off into the surrounding atmosphere. To successfully dry substances in this way, two points must be observed, namely, the water which accumulates in the heater must be constantly removed, and the air, which absorbs the vapor from the drying material, must be changed so often as not to become saturated. Free circulation of air in drying rooms heated by enclosed steam is therefore an absolute essential to success, and it should be secured even if necessary to use fans for the purpose. Cold dry air will dry substances faster than hot air saturated with watery vapor.

There are many substances, such as cotton or woolen yarn, white lead, sand, etc., that, having a great attraction for water, will not dry rapidly when confined steam at 212° Fahr. is employed. At this temperature, there is slow evaporation from the surface. The water converted into steam is condensed and held by action of capillary attraction at the surface. The water is thus slowly forced from the interior outward, and so on until the substance is at last sufficiently dried When drying is performed solely by heat externally applied, it will proceed almost as well at 90° as at 210°, provided a good circulation of air is maintained. The air cannot take up the water faster than the capillary attraction will convey it from within to the surface, and as up to a temperature of 212° this action is in no way aided by the expansive force of steam generated at higher temperatures in the interior, a

great deal of heat may be wasted by carrying a temperature, higher than necessary to maintain surface evaporation, yet too low to produce evaporation from the interior.

When a higher temperature, say that corresponding to 45 lbs. pressure or 292° Fahr. is maintained, a very different action takes place. The water in the substance to be dried is then converted into steam of sufficient tension to not only overcome adhesive attraction, but to expand and force its way out and to float away as steam does from the exhaust of a steam engine. This accounts for the fact stated by a recent correspondent, published in answers to queries, to wit.: that in drying woolen yarn, he finds it necessary to carry forty-five pounds pressure of steam in his drying cylinder. As soon as the temperature corresponding to this pressure is reached, the yarn dries rapidly, while at all lower temperatures the drying is a tedious process.

So much for drying by steam inclosed in pipes. The direct admission of saturated steam into the interstices between solid bodies, which are not only to be dried but heated, has been found in practice to answer admirably in some cases. In this method of using steam, it is received in closed retorts containing the substance to be dried and heated. The steam immediately heats the material, and in doing so becomes condensed. The water of condensation is drawn off, as it forms. The solid bodies attain the temperature of the steam with great rapidity. As soon as this is the case, the following conditions exist in the retort: The bodies are hot and their surfaces are dripping wet with the water of condensation. Now, if they have a temperature sufficiently high, and are sufficiently large, the heat they contain will evaporate all the water upon their surfaces, and still leave the bodies at a temperature of 212° Fahr. or higher, whenever the flow of steam from the boiler is cut off, and the retort is opened or allowed to exhaust into a second retort containg another charge of cold material. This method has been employed with great success for heating broken stone for paving purposes, gravel for roofing, etc. The reader will find full description of a patented invention of this kind on page 305, last volume of the SCIENTIFIC AMERICAN.

Water may be extracted from solutions by the direct injection of superheated steam. Every pound of superheated steam will convert such an amount of water at 212° into saturated steam as corresponds to the excess of heat in the superheated steam over that of one pound of saturated steam. In doing this, it becomes reduced to saturated steam and passes off as such without condensation, carrying with it 967 units of latent heat. Therefore this method of drying or concentrating solutions must be exceedingly wasteful unless the heat in the saturated steam can be subsequently used. It may, however, be employed advantageously in some processes where it is an object to maintain a constant temperature, and in which economy is of secondary importance.

AMERICAN HOMESTEADS.

There is a peculiar charm about old houses, which is seldom felt in America. In Europe, one finds everywhere quaint old buildings, in which generation after generation have been born and reared, and have married and died. Every nook and corner of the building is clustered over with memories and associations. The change of such a mansion from the possession of one family into that of another is regarded as a humiliation, and mourned as disaster. This feeling is not without a salutary moral effect. It cultivates a family pride, a feeling of honor in the family name, which, handed down from father to son, is sought to be maintained through successive generations. It begets a sentiment of unity, among those who bear the same name and are connected by ties of blood, which strengthens these ties, and tends more or less to make each regardful of the interests of all.

But here in America there are, as a rule, no old houses. The son tears down what the father built, or passes it into other hands with little or no regret or compunction. He builds again that which his sons shall raze or sell, regarding merely his own convenience, and careless who shall dwell in the spot he inhabits after he has quitted it forever. Almost all our building is for the present. We erect with a view to tearing down, not for permanence, and hence it is that our architecture has an unsatisfactory air of instability, of cheapness, and temporary expediency, which offends cultivated taste, and goes far to justify the assertion that American architecture as an art is scarcely to be met with in our homes.

It is true there are some fine and costly residences, scattered about through the country and grouped in our large cities, but throughout the land, cheap frame buildings, with scarcely an appearance of design, offend the eye by uncouth forms, shapeless sculpture, and glaring white or dingy mud colored exteriors. Though we do not dwell in tents, like some of the Tartar tribes, we are essentially nomadic in our habits and tastes. Boys escape as soon as possible from unattractive homes, to chance their luck in cities, or hew out fortunes on frontiers. Young men clear off farms in the far west, sell them at the first apparently good offer and try it over again. Land, with us, is not a thing to be kept if possible, but to be speculated in. Cultivation of soil is too often only the temporary improvement preparatory to sale.

Thus increases and flourishes that restless, wandering spirit which characterizes the true Yankee born American. Considerations of love for the spot, on which one has been born and bred, are feeble when placed against hopes of profit. All this may, perhaps, find some compensation in the enterprising spirit it engenders; but it does not make our rural homes picturesque piles half hidden by honeysuckle, ivy, and woodbine, like the garden embowered farm houses and cottages of England.

Much has been written with a view to improve our architectural taste as a nation, but we are yet too young to progress rapidly in this respect. The greater portion of our land is too cheap. We have too much elbow room, and we are too fond of change. We do not wish to spend much money on what we may, in a few years at furthest, cease to occupy. So we go on the cheap principle in building, and content ourselves with mere bodily comfort, sacrificing æsthetic considerations to utility. It is vain, therefore, to expect any great general improvement in architecture until we shall have advanced beyond adolescence as a nation. When the great West shall have absorbed all it will hold of the world's population, and people look to die where they are born, homesteads will be beautified, and a sense of what is meant by the word home will be so impressed, upon the minds and hearts of youths, that to adorn the place of nativity will seem almost a duty.

THE STUPIDITY OF IGNORANCE.

Some three years ago, the Commissioners of the Central Park, New York, at the instance of some of our leading scientific men, undertook to establish a palæozoic museum, where the pupils of the public schools and those interested in the study of natural history might find specimens of the earliest animal creations, now extinct, and acquire useful knowledge of their forms and habits. For this purpose Mr. B. Waterhouse Hawkins, one of the most learned and talented of professional men, was empowered to construct the restorations, and upon them he labored as assiduously as means were provided for nearly two years, when a political change took place, by which a new set of Commissioners came into power. These men were under the control of an Irish politician, the head of the notorious gang known as the Ring, by whom the city treasury was plundered of so many millions.

One of the first acts of these blundering and ignorant Commissioners was to annul the contract made with Mr. Hawkins, and arrest his work. He recently stated that all he had done during twenty-one months to restore the skeletons of the extinct animals of America (of the Hadrosaurus, and the other gigantic animal, which was thirty-nine feet long), was destroyed by order of Mr. Henry Hilton, late vice president of the Commission, on the 3d of May last, with sledge hammer, carted away and buried. The preparatory sketches of other animals, including a mammoth and a mastodon, and the molds and sketch models were also destroyed. Mr. Hilton did this, said Mr. Hawkins, out of ignorance, just as he had a coat of white paint put on the skeleton of a whale which Mr. Peter Cooper had presented to the Museum, and just as he had a bronze statue painted white. Mr. Hilton told the celebrated naturalist, who had come from England to undertake the work, that he should not bother himself with "dead animals," that there was plenty to do among the living. This illustrates the policy of having such ignorant men as Hilton at the head of one of the most important departments of the city government. A new and more intelligent set of Commissioners having recently come into power, the skeletons were dug up again, but they were found broken in thousands of pieces. Professor Henry, of the Smithsonian Institute, when he heard of this piece of barbarism, would not believe it. "Why," he exclaimed, "I would have paid them a good price for the work." Mr. Hilton, however, preferred to destroy the work of the naturalist, which has cost the city at least $12,000.

THE POSITIVE MOTION LOOM GRAND MEDAL OF HONOR.

This exceptional prize of the American Institute, awarded only to inventions of such great importance as to promise a revolution in the industries to which they are applied, was, as our readers are aware, awarded to Mr. James Lyall for his Positive Motion Loom, on its first exhibition at the annual fair held by the Institute. After some delay, the medal has been struck, and is now in the possession of Mr. Lyall. It is of gold, large and handsome; and is mounted in a beautiful case. It is a just recognition of a masterpiece of ingenuity. The loom was shown again at the last year's exhibition with very marked improvements, which, according to unanimous opinion, have greatly increased its utility. All the predictions made by us in our description of this invention, page 17, Vol. XXI, have been fully verified, and although the proprietors have had to contend with a disastrous fire, they are meeting with the most gratifying success in the introduction of their looms. The invention has been applied with remarkable advantage in the weaving of corsets and the manufacture of wire cloth, as well as oil cloth foundation, druggets, etc., and several new and large manufactories have been put into operation, employing the positive motion loom in the industries named. The inventor, Mr, James Lyall, is one of those men whose characteristic modesty and other good qualities secure the heartiest goodwill from all who know him, and a choice party of these friendly well wishers honored the occasion of the presentation of the medal, on the evening of February 22, at his residence in this city.

GLYCERIN CEMENT.—A cement, said to be capable of use where resistance to the action of both water and heat is required, is composed by mixing ordinary glycerin with dry litharge, so as to constitute a tough paste. For uniting the joints of steam pipes and other similar applications, this preparation is said to be very satisfactory.

MR. J. F. MCCURDY writes to us to suggest that grindstones are often burst by the strain on the center caused by the shaft, and that centrifugal force is not the sole cause of such accidents.

SCIENTIFIC AND PRACTICAL INFORMATION.

GUN COTTON.

In our number of September 3, 1871, we described the apparent dangers and difficulties of the manufacture of gun cotton; and we are now in possession of a report of a commission of enquiry, appointed by the British Secretary of State for War, which gives some information which will interest many of our readers. The committee decided that compressed gun cotton is not uncertain or perilous in use; and, as an explosive, it is effective, certain, safe, and portable. The paper pulp gun cotton of Mr. Abel's invention is capable, says the report, of being more thoroughly purified than the ordinary cotton in cords or skeins, and moreover is, from being prepared in a wet state, uninflammable up to the time of its leaving the press. The drying is alone the dangerous part of its manufacture.

SULPHURETTED ALCOHOL.

Professor Gamgee informs us of a new concentrated disinfectant, obtained by impregnating alcohol with sulphurous acid, of which gas it is capable of containing no less than three hundred times its own volume. The portability and convenience of such a fluid will be obvious to every one; its general use as a disinfectant will be probably somewhat qualified by the nauseous smell. But for the destruction of insects and as a substitute for fumigation with burning sulphur, it has the recommendation of apparent efficiency.

SUBSTITUTES FOR GUNPOWDER.

The exigencies of the people and authorities during the protracted siege of Paris called out many improvements and substitutes for articles in common use. M. Deplazanet, of Grenelle (a suburb of Paris, within the besiegers' lines), produced a powder in which chlorate of potash was used instead of saltpeter (nitrate of potash). This preparation answered well for torpedoes and mining purposes, but it proved to be so destructive to metal as to be unfit for use in small arms and artillery. It was composed of 2 parts chlorate of potash, 1 part of prussiate of potash, and 1 part of powdered sugar. These ingredients are known to be very dangerous when combined, and it is not to be wondered at that the factory of M. Deplazanet was destroyed by an explosion, which catastrophe put an end to the manufacture.

ELECTRICAL EXPLODERS.

Mr. Clemens Herschel, of Boston, Mass., writes to call public attention to the dangerous implement called an electrical exploder, used for igniting blasting charges, etc., by electricity. It is said to be so sensitive that dusting near it with a feather duster produces sufficient electricity to discharge it, and the use of a rubber comb may occasion a similar accident. He suggests that such contrivances, useful enough in their proper places, should be so constructed that the spark of a battery would be needed to discharge them. There is reason in the suggestion, as a battery is always used for the purpose.

STACKING LUMBER.

The news of a distressing accident in which some little children were crushed by falling lumber, in Newcastle on Tyne, England, warrants us in calling attention to the dangers of our lumber yards and the insecure manner in which high piles of timber and boards are stacked. In many of our cities, it is common to see stacks of great weight piled together without due regard to safety, giving the next high wind an opportunity of toppling them to the ground. Children are apt to seek lumber yards to play, and we would warn our lumber merchants to guard against such an accident as has recently occurred in England.

New Invention.

The Girard *Cosmopolite* says that, at a certain station on the Philadelphia and Erie Railroad, the company has a new night telegraph operator, who, if inclined to slumber, is too ingeniously wide awake to be caught napping at his post. Recently he was seized with drowsiness which he could not shake off. As it was his duty to report all passing, he dared not yield, and yet could not resist. That mother of invention, necessity, at length suggested an alarm signal, which he proceeded to put in operation by suspending a scuttle full of coal, by means of a cord which was passed through the keyhole of his office door and fastened across the track at the requisite elevation. Mr. Operator then resigned himself to rosy dreams, which were finally interrupted by a passing train, the engine of which snapped the cord, causing the coal scuttle to come down with a rattle-te-bang that would have aroused even a sleeping Erie policeman. Another young operator, some thirty miles up the road, let a train slip by him the same night, and applied to the inventor of the coal scuttle alarm to know, when the train passed his station. No answer was vouchsafed, the inventor remarking "Why don't the darned fool get the right to use my patent?"

THE *Lens* is the title of a new quarterly magazine, of microscopy and its allied natural sciences, published by the State Microscopical Society of Illinois, at Chicago: S. A. Briggs, editor. The first number is before us. It is illustrated with a variety of diagrams of monads, and contains a large amount of useful matter, rather technological in character, but of value to the trained microscopist. The *Lens* promises to be a valuable addition to the scientific periodical literature of our country. We trust that it will be well sustained.

HUMILITY is the lesson of science. It is by measuring ourselves against the unsolved mysteries of science that we learn our feebleness.